

Formulas and Percents

Use at the beginning of the school year

Use the formulas and the values given to calculate the area or volume for each figure.

Formulas:

$$\text{Area of a Circle} = \pi r^2$$

$$\text{Surface Area of a Sphere} = 4\pi r^2$$

$$\text{Volume of a Sphere} = \frac{4\pi r^3}{3}$$

$$\text{Volume of a Cone} = \frac{\pi r^2 h}{3}$$

$$\text{Volume of a Cylinder} = \pi r^2 h$$

$$\text{Area of a rectangle: } \ell w$$

$$\text{Volume of a rectangular prism: } \ell wh$$

$$\text{Area of a triangle: } \frac{bh}{2}$$

$$\text{Volume of a rectangular pyramid: } \frac{\ell wh}{3}$$

1. A circle has a radius of 14 cm. A second circle is 160% as wide as the first circle. Find the area of each circle, then complete the blanks in the sentence below.

If the ratio of the radii is 1.6:1, the ratio of the areas is _____.

2. A triangle has a base of 12 m and a height of 6 m. A second triangle has sides 45% smaller than the first triangle. Find the area of each triangle, then complete the blanks in the sentence below.

If the ratio of side lengths is 1:0.55, the ratio of the areas is _____.

3. A rectangular container has a width of 12 feet, a length of 8 feet, and a height of 6 feet. A second container is 10% shorter and 5% wider than the first one. Find the volume of each shipping container and tell which is larger.

4. An ice-cream cone holds a ball of ice cream that is 8 cm across. If the length of the cone from top to bottom is 23 cm, find the volume of the ice cream ball and the volume of the ice cream cone.

5. What is the ratio of volume to surface area of a sphere? Use algebra on the formulas to find the ratio. Find the volume and surface area of a yoga ball with a radius of 18 inches. Compare the ratio of this volume to surface area with the ratio of the formulas.
